

Bioassays of the City of

Atlantic Beach Wastewater Treatment Plant

Jacksonville, Duval County, Florida

NPDES #FL0038776

Sampled 11/1/99

May 2001

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Atlantic Beach Wastewater Treatment Plant

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Bureau of Laboratories
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Introduction

City of Atlantic Beach Wastewater Treatment Plant, 1100 Sandpiper Lane, Jacksonville, Duval County, Florida, NPDES #FL0038776, tests performed on 2 to 4 November 1999.

This wastewater treatment plant has a design flow of 3.0 MGD. The wastewater is treated with four static screens, an aerated grit chamber, a flow equalization basin, two aeration tanks, and two secondary clarifiers. The effluent is disinfected in chlorine contact chambers and dechlorinated using sulfur dioxide in dechlorination chambers. The effluent is also aerated before being discharged and pumped to the Class III waters of the St. John's River at Shermans' Point (facility summary provided by J. Lippincott, FDEP, Jacksonville).

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1993, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition, EPA/600/4-90/027F.

Results and Discussion

The FDEP Biology Section performed two 48-hour static acute screening toxicity bioassays on a sample of effluent from the City of Atlantic Beach WWTP. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The test results did not indicate toxicity at 48 hours (Table 1).

Total residual chlorine and total ammonia were not detected in the sample. Further chemical analyses were performed on the sample, and several metals were identified (Table 2).

Conclusion

The sample of effluent collected from this facility November 1, 1999, did not show toxicity at 48 hours.

Table1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City of Atlantic Beach Wastewater Treatment Plant, 1100 Sandpiper Lane, Jacksonville, Duval County, Florida, NPDES# FL0038776, performed on 2 to 4 November 1999.

Facility:	Atlantic Beach WWTP			NPDES #	FL0038776	Facility Type:	Wastewater Treatment Plant
Location:	1100 Sandpiper Lane			Contact/District:	O'connor/ Northeast		
County:	Duval			Test type:	static acute screen		
Sample Collection Date:	11/1/99	Time:	1330	# tests:	2	Receiving Water:	St. John's River
Test Beginning Date:	11/2/99	Time:	1415	Chlorination Type:	Chlorinated		
Test Ending Date:	11/4/99	Time:	1400		sample collected after dechlorination		Page 1 of 1

Total Residual CL2	mg/L	Method
Field:	0.03	N/A
Lab:	<0.03	DR-100

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	< 0.017	<0.017
20% Dilute Mineral Water (cladocerans):	< 0.017	<0.017
100% Sample:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	140	135
20% Dilute Mineral Water (cladocerans):	76	85
100% Sample:	115	228

Salinity[C]	(ppt)
Control Water:	<1
100% Sample:	<1

[C] Salinity based on conductivity and temperature measurements.

Organism: *Ceriodaphnia dubia* Life stage: < 24 hours old

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/20	5	5	5	7.9	-	8.3	25.2	-	23.2	7.4	-	7.8	210	215
Control B	0/20	5	5	5	-	-	8.3	-	-	23.0	-	-	7.8	-	200
Control C	0/20	5	5	5	-	-	8.3	-	-	22.9	-	-	7.9	-	195
Control D	0/20	5	5	5	-	-	8.3	-	-	22.9	-	-	7.9	-	200
100% A	20/0	5	5	5	7.2	-	8.4	24.8	-	23.1	7.3	-	7.9	810	1030
100% B	20/0	5	5	5	-	-	8.4	-	-	23.1	-	-	8.0	-	1070
100% C	20/0	5	5	5	-	-	8.4	-	-	23.1	-	-	7.9	-	1060
100% D	20/0	5	5	5	-	-	8.4	-	-	23.1	-	-	7.9	-	1090

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.0-26.0°C.
Incubator #2 temperature range for the test period was 24.5-26.5°C.

Organism: *Cyprinella leedsi* Age: 11 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen			Conductivity Uncorrected µmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/500	5	5	5	7.9	8.3	8.4	24.6	24.1	25.1	7.2	7.1	7.4	275	290
Control B	0/500	5	5	5	7.9	8.3	8.4	24.2	24.1	25.2	7.2	7.3	7.3	250	280
Control C	0/500	5	5	5	7.9	8.3	8.4	24.2	24.1	25.6	7.2	7.2	7.2	250	285
Control D	0/500	5	5	5	7.9	8.3	8.4	24.3	24.0	25.1	7.2	7.4	7.2	250	275
100% A	500/0	5	5	5	7.1	7.8	8.4	24.6	24.1	25.6	7.2	6.8	6.9	930	985
100% B	500/0	5	5	5	7.1	7.8	8.4	24.6	24.1	25.2	7.1	6.8	6.7	940	970
100% C	500/0	5	5	5	7.1	7.8	8.0	24.6	24.1	25.0	7.1	6.9	6.7	940	980
100% D	500/0	5	5	5	7.1	7.8	7.9	24.7	24.0	24.8	7.1	6.9	6.7	945	970

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.0-26.0°C.
Incubator #3 temperature range for the test period was 23.5-25.0°C.

Table 2. Results of chemical analyses on the effluent from the City of Atlantic Beach WWTP sampled on November 1, 1999.

Metals

Cadmium	0.048	µg/L	I
Calcium	61.5	mg/L	
Copper	5	µg/L	
Iron	41	µg/L	I
Lead	0.46	µg/L	I
Magnesium	25.3	mg/L	
Zinc	33	µg/L	I

Pesticides and Herbicides

None detected

Base, Neutral, & Acid Extractable Organics

None detected

Oils and Grease

None detected

I Value reported is less than the minimum quantitation limit and greater than or equal to the minimum detection limit.

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Jacksonville Beach WWTP
County: Duval
Contact / District: O'Connor / NE-DIST.
NPDES Permit #: FL0038776
LIMS Sample #: 415966 LIMS Job #: DH-1999-11-02-17-01
sample log 11-12-99 mf
Test Type: (Screening) Definitive
(Static) Static Renewal I Flow-through
Test Number: 1 of 2

Sample Collection: Date 11/1/99 Time 1330
Test Beginning: Date 11/2/99 Time 14:15
Test Ending: Date 11/4/99 Time 1400
Organism Batch #: 55 Diluent Batch #: 44
Organism Age: <24 hrs SRT toxicant batch #: N/A
Test organism: C dubia

Remarks: @ DPH 11/2/99 Wrong Place

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) 0 hr	UNCORRECTED Cond. (mmhos/cm) 24 h	UNCORRECTED Cond. (mmhos/cm) 48 h
CTRL A	~~DHQ~~ A	5	5	5	7.9	-	8.3	25.2	-	23.2	7.4	-	7.8	210	-	215
B	~~H10~~ B	5	5	5	-	-	8.3	-	-	23.0	-	-	7.8	-	-	200
C	~~H11~~ C	5	5	5	-	-	8.3	-	-	22.9	-	-	7.9	-	-	195
D	~~H12~~ D	5	5	5	-	-	8.3	-	-	22.9	-	-	7.9	-	-	200
100% A	~~H13~~ A	5	5	5	7.2	-	8.4	24.8	-	23.1	7.3	-	7.9	810	-	1030
B	~~H14~~ B	5	5	5	-	-	8.4	-	-	23.1	-	-	8.0	-	-	1070
C	~~H15~~ C	5	5	5	-	-	8.4	-	-	23.1	-	-	7.9	-	-	1060
D	~~H16~~ D	5	5	5	-	-	8.4	-	-	23.1	-	-	7.9	-	-	1090
measured by:		MF	MF	MF	DPH	-	MF	DPH	-	MF	DPH	-	MF	DPH	-	MF
recorded by:		SG	MF	MF	SG	-	EBM	SG	-	EBM	SG	-	EBM	SG	-	EBM

Investigators' Signatures

Temperature Range °C
Incubator # 2 26.5 - 24.5°C
Room 6246 26.0 - 23.0°C

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):	[redacted]		0.03	MA	EJ Perez	EJ Perez
Lab Total Residual Cl2 (mg/L):	/	<0.03	<0.03	DR100	SG	DPH
Alkalinity (mg/L as $CaCO_3$):	/	76	115	~~HACH~~ SG	SG	DPH
Hardness (mg/L as $CaCO_3$):	/	85	288	~~HACH~~	SG	DPH
Total ammonia (mg/L as N):	<0.017	<0.017	<0.017	Denver	DPH	SG
Salinity:	/	0	0	451	DPH	SG

reviewer

form updated 3/3/99

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Atlantic Beach WWTP
County: Duval
Contact / District: O'Connor / NE - Dist.
NPDES Permit #: FL0038776
LIMS Sample #: H159166 LIMS Job #: TH-1999-11-02-17-01
sample log 11-1999-af
Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through
Test Number: 2 of 2

Sample Collection: Date 11/1/99 Time 1330
Test Beginning: Date 11/2/99 Time 1415
Test Ending: Date 11/4/99 Time 1400
Organism Batch #: 84 Diluent Batch #: Well
Organism Age: 11 days SRT toxicant batch #: N/A
Test organism: C. dubia

Remarks:

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) (Cond. (µmhos/cm)) 0 hr	24 h	48 h
CTRL A	H9	5	5	5	7.9	8.3	8.4	24.6	24.1	25.1	7.2	7.1	7.4	275	290	290
B	H10	5	5	5	7.9	8.3	8.4	24.2	24.1	25.2	7.2	7.3	7.3	250	275	280
C	H11	5	5	5	7.9	8.3	8.4	24.2	24.1	25.6	7.2	7.2	7.2	250	290	285
D	H12	5	5	5	7.9	8.3	8.4	24.3	24.0	25.1	7.2	7.4	7.2	250	270	275
100% A	H13	5	5	5	7.1	7.8	8.4	24.6	24.1	25.6	7.2	6.8	6.9	930	~~860~~ 940	985
B	H14	5	5	5	7.1	7.8	8.4	24.6	24.1	25.2	7.1	6.8	6.7	940	925	970
C	H15	5	5	5	7.1	7.8	8.0	24.6	24.1	25.0	7.1	6.9	6.7	940	975	980
D	H16	5	5	5	7.1	7.8	7.9	24.7	24.0	24.8	7.1	6.9	6.7	945	960	970
measured by:		DPH	MA	MF	DPH	DPH	MF	DPH	DPH	MF	DPH	DPH	MF	DPH	DPH	MF
recorded by:		MF	MA	MF	SG	MF	EBM	SG	MF	EBM	SG	DPH	EBM	SG	MF	EBM

A 94 mf III 6 Day

Investigators' Signatures

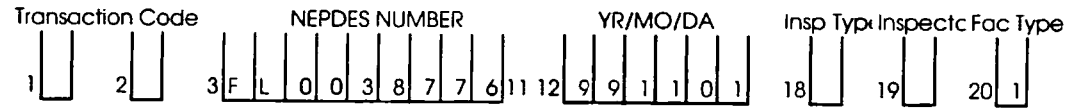
Temperature Range °C
Incubator #3 25.0 – 23.5°C
Room B246 26.0 – 23.0°C

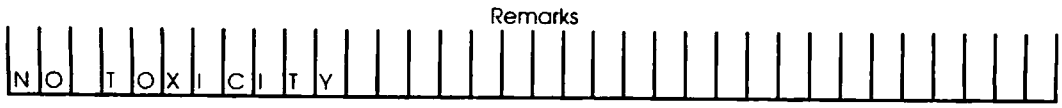
Water Quality Parameters	Salt Water: Well Water	20% Min Water	Sample	Method	Measured by	Verified
Field Total Residual Cl2 (mg/L):			0.03	MA	RS Perez	RS Perez
Lab Total Residual Cl2 (mg/L):	<0.03		<0.03	DR100	SG	DPH
Alkalinity (mg/L as $CaCO_3$):	140		115	HACH	SG	DPH
Hardness (mg/L as $CaCO_3$):	135		288	HACH	SG	DPH
Total ammonia (mg/L as N):	<0.017		<0.017	Denver	DPH	DPH
Salinity:	0		0	YSI	DPH	DPH

reviewer form updated 3/3/99

The Bioassay of the City of Atlantic Beach WWTP effluent sampled on November 1, 1999, NPDES #FL0038776.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Or

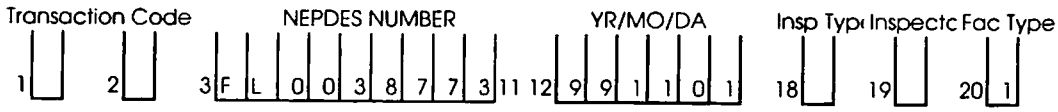


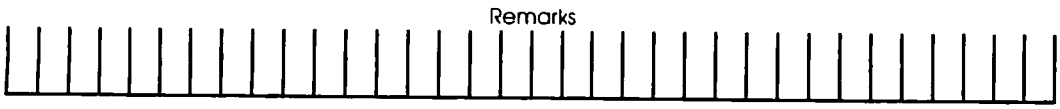


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The Priority Pollutants Analysis for Bioassay of the City of Atlantic Beach WWTP effluent sampled on November 1, 1999, NPDES #FL0038776.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Or





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